Geoarchaeological Investigations in the Upper Neosho River Basin, Eastern Kansas

Research Goals

1. Provide a preliminary assessment of the spatial and temporal patterns of landscape evolution in the Upper Neosho River basin
2. Construct a preliminary predictive model for buried cultural resources in the basin

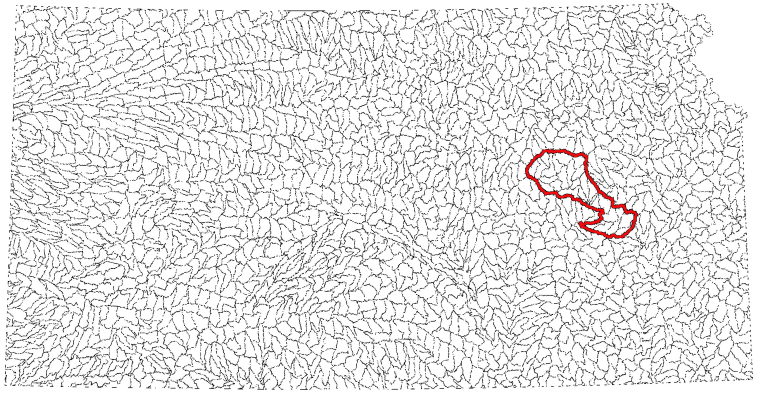
Data Sources

HUC - Hydrologic Unit Level 14 Code Boundaries. U.S. Department of Agriculture/ Natural Resources Conservation Service

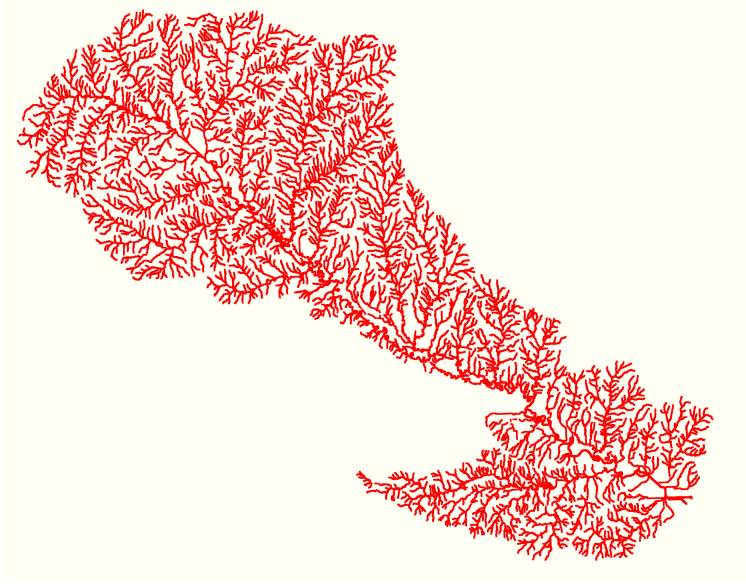
SSURGO – County level soil survey data. U.S. Department of Agriculture/ Natural Resources Conservation Service

NHD Flowlines - National Hydrography Dataset. U.S. Geological Survey

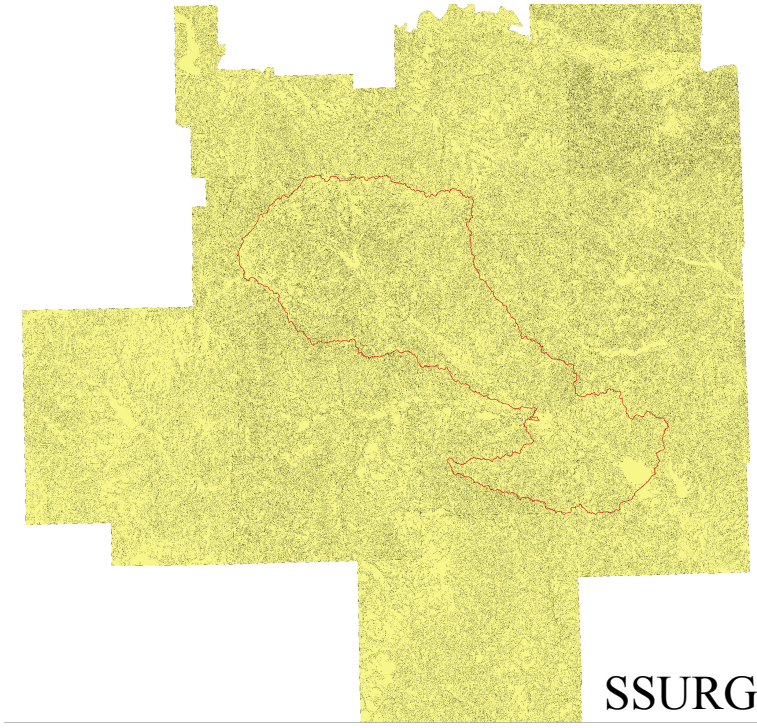
Step One: Define the basin & clip data sources



HUC Hydrologic Unit Level 14 Code (NRCS)



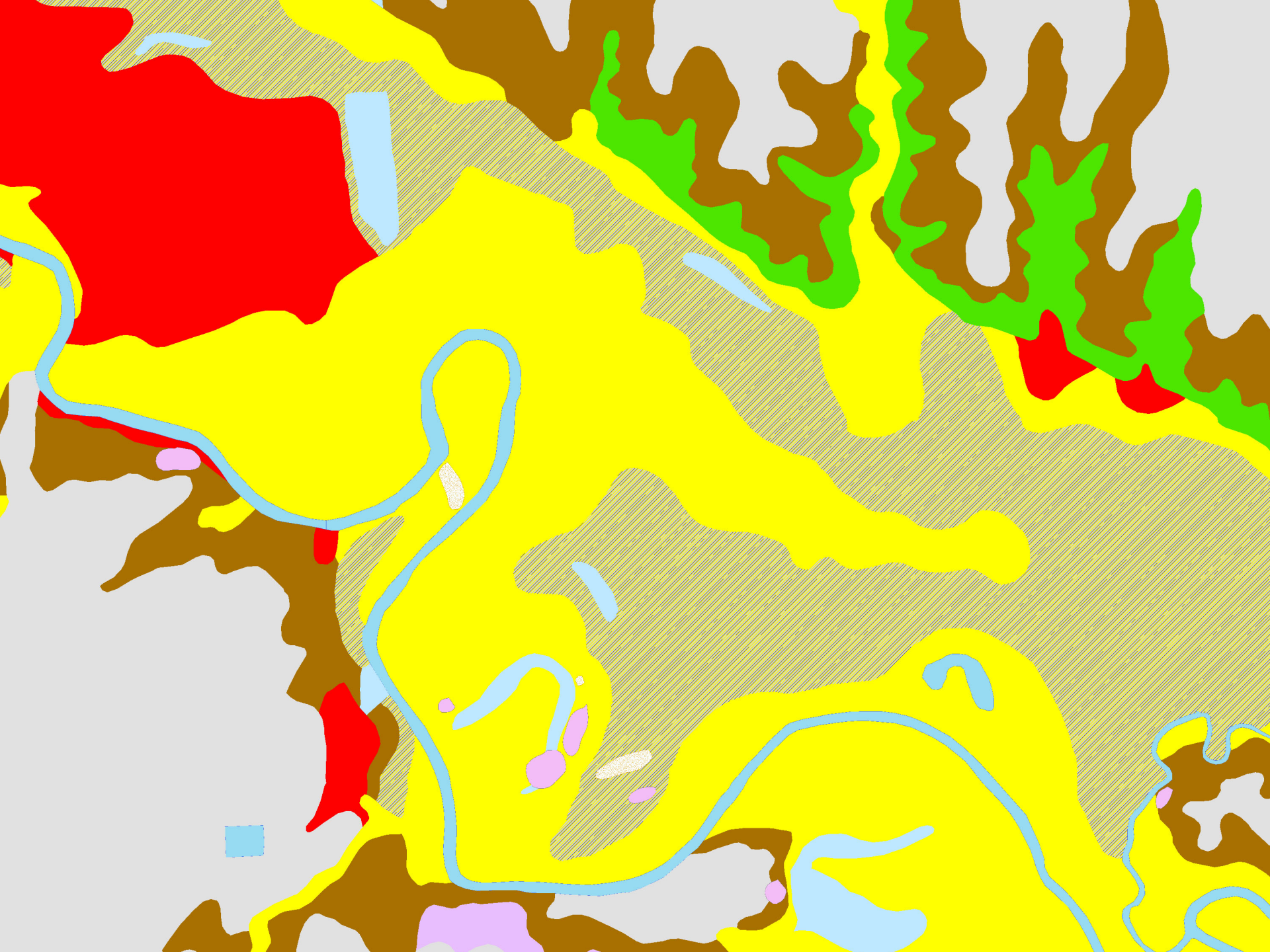
NHD Flowlines - USGS



SSURGO- County level soil survey data (NRCS)

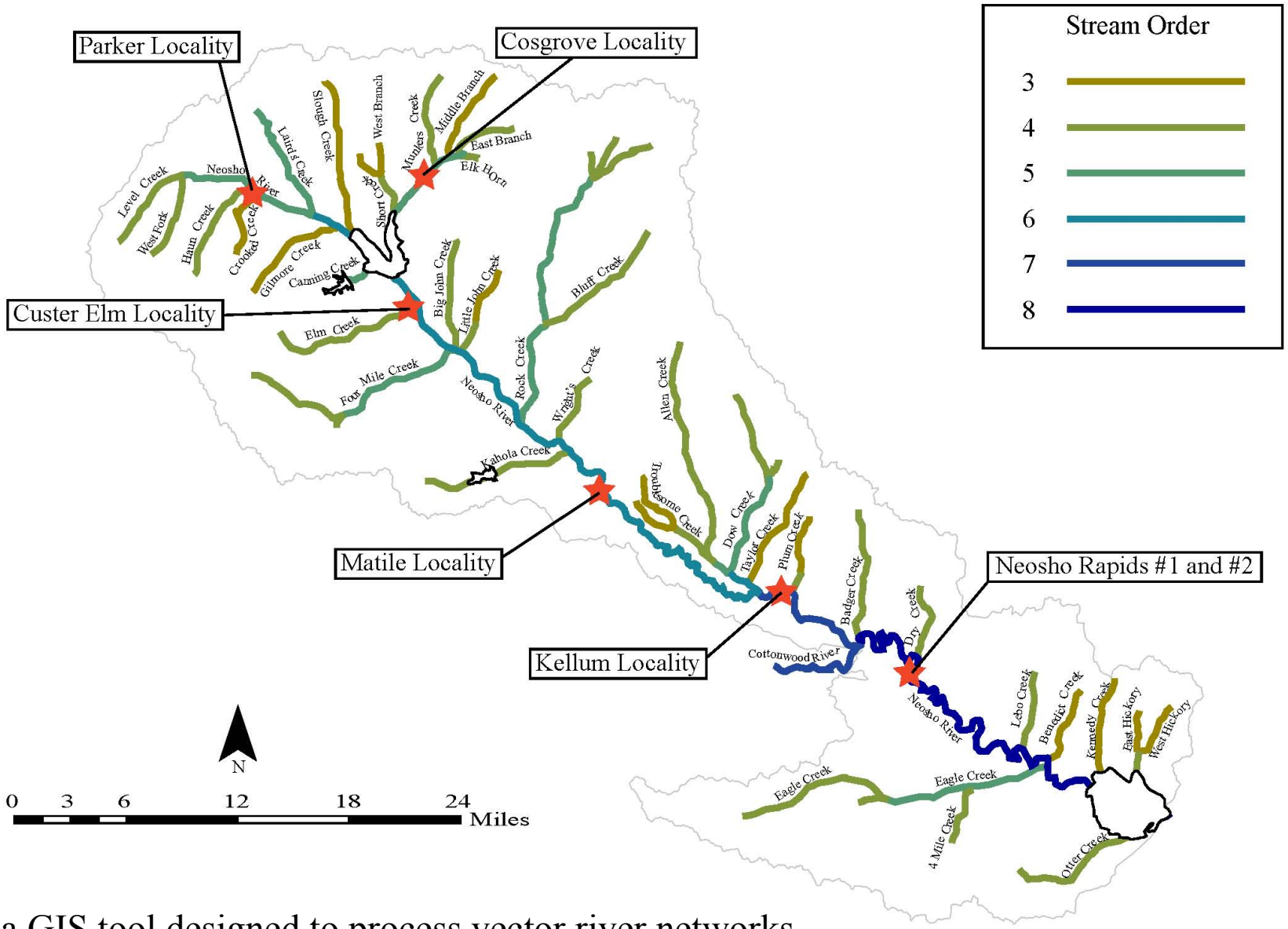
Step Two: Define and map basin landforms

Soil Series	Geomorphic Surface	Parent Material	Family or higher taxonomic class
Ivan	floodplains (T-0)	calcareous, silty alluvium	Fine-silty, mixed, mesic Cumulic Hapludolls
Lanton	floodplains (T-0)	alluvium	Fine-silty, mixed, thermic Cumulic Haplaquolls
Verdigris	floodplains (T-0)	silty alluvium	Fine-silty, mixed, active, thermic Cumulic Hapludolls
Chase	low terraces (T-1)	silty and clayey alluvium	Fine, smectitic, mesic Aquertic Argiudolls
Leanna	low terraces (T-1)	alluvium	Fine, mixed, thermic Typic Argialbolls
Mason	low terraces (T-1)	silty alluvium	Fine-silty, mixed, superactive, thermic Typic Argiudolls
Osage	low terraces (T-1)	alluvium	Fine, smectitic, thermic Vertic Haplaquolls
Reading	low terraces (T-1)	silty alluvium	Fine-silty, mixed, superactive, mesic Pachic Argiudolls
Tully	footslopes in the uplands	clayey alluvium or colluvium	Fine, mixed, mesic Pachic Argiustolls
Zaar	footslopes in the uplands	residuum from shale	Fine, montmorillonitic, thermic Vertic Hapludolls
Apperson	hillslopes on uplands	residuum from shale	Fine, smectitic, thermic Vertic Argiudolls
Bates	hillslopes on uplands	residuum from sandstone and loamy shale	Fine-loamy, siliceous, thermic Typic Argiudolls
Clime	hillslopes on uplands	residuum from calcareous clayey shale	Fine, mixed, mesic Udorthentic Haplustolls
Collinsville	hillslopes on uplands	residuum from sandstone	Fine, mixed, thermic Aquic Argiudolls
Dennis	hillslopes on uplands	residuum from shale	Fine, mixed, thermic Aquic Argiudolls
Dwight	hillslopes on uplands	clayey sediments	Fine, smectitic, mesic Typic Natrustolls
Elmont	hillslopes on uplands	residuum from shale	Fine-silty, mixed, superactive, mesic Typic Argiudolls
Eram	hillslopes on uplands	residuum from shale	Fine, mixed, thermic Aquic Argiudolls
Florence	hillslopes on uplands	residuum from cherty limestone	Clayey-skeletal, smectitic, mesic Udic Argiustolls
Irwin	hillslopes on uplands	clayey sediments	Fine, mixed, mesic Pachic Argiustolls
Kenoma	hillslopes on uplands	Pre-Holocene alluvial sediments	Fine, smectitic, thermic Vertic Argiudolls
Labette	hillslopes on uplands	residuum from limestone and shale	Fine, mixed, mesic Udic Argiustolls
Lula	hillslopes on uplands	residuum from limestone and shale	Fine-silty, mixed, active, thermic Typic Argiudolls
Martin	hillslopes on uplands	clayey shale	Fine, smectitic, mesic Aquertic Argiudolls
Matfield	hillslopes on uplands	residuum from cherty limestone	Clayey-skeletal, smectitic, mesic Pachic Paleustolls
Olpe	hillslopes on uplands	Pre-Holocene alluvium	Clayey-skeletal, smectitic, thermic Typic Paleudolls
Shidler	hillslopes on uplands	residuum from limestone	Fine, mixed, thermic Aquic Argiudolls
Smolan	hillslopes on uplands	loess (reddish brown)	Fine, smectitic, mesic Pachic Argiustolls
Sogn	hillslopes on uplands	residuum from limestone	Loamy, mixed, superactive, mesic Lithic Haplustolls
Summit	hillslopes on uplands	residuum from shale	Fine, smectitic, thermic Oxyaquic Vertic Argiudolls
Vinland	hillslopes on uplands	sandy and silty residuum from shale	Loamy, mixed, superactive, mesic, shallow Typic Hapludolls
Woodson	hillslopes on uplands	Pre-Holocene alluvial sediments	Fine, smectitic, thermic Abruptic Argiaquolls
Ladysmith	hillslopes/terraces on uplands	Pre-Holocene alluvial sediments	Fine, smectitic, mesic Udertic Argiustolls
Clareson	ridges on uplands	residuum from limestone	Clayey-skeletal, mixed, thermic Typic Argiudolls
Konza	ridges on uplands	loess	Fine, smectitic, mesic Udertic Paleustolls



Step Three: Determine stream orders in the basin

(used RivEx Program)



RivEX is a GIS tool designed to process vector river networks

Step Four: Determine relative ages of LSAs in the basin

Locality	Radiocarbon Ages (yrs. Bp)	Landform	Stream Order
Parker	**9700 ± 210** 8900 ± 70	T-1	5
Cosgrove	1640 ± 20 1960 ± 70	T-0b	5
Shorlin	1830 ± 25	T-0b	4
Matile	8665 ± 25 9000 ± 70 9410 ± 35	T-1	6
Kellum	3590 ± 20 4460 ± 510	T-1	6
Neosho Rapids #2	2755± 20	T-1	7

Step Five: Construct a preliminary predictive model for buried cultural deposits of different ages

Cultural Period	Alluvial Fans and Colluvial Aprons: Corrington Member	Terraces: Gunder Member	Floodplain: Honey Cr. Member	Floodplain: Roberts Cr. Member	Floodplain: Camp Cr. Member
Paleoindian	+ + +	+ + +	-	-	-
Early Archaic	+ + +	+ + +	-	-	-
Middle Archaic	+ + +	+ + +	+ + +	-	-
Late Archaic	+ + +	+ + +	+ + +	+ + +	-
Woodland	+	+	+	+ + +	-
Historic	-	-	-	-	+ + +

- Not Possible
+ Low Potential
+ + Moderate Potential
+ + + High Potential